



10/009011 #6
10 Rec'd ST/PTO 19 JUL 2002

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<110> Nam, Jae-Hwan
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Pro Gly Cys Ser Phe Ser Ile Phe Leu Leu Ala Leu Leu Ser Cys Leu
 340 345 350

Thr Val Pro Ala Ser Ala Tyr Gln Val Arg Asn Ser Ser Gly Leu Tyr
 355 360 365

His Val Thr Asn Asp Cys Pro Asn Ser Ser Ile Val Tyr Glu Ala Ala
 370 375 380

Asp Ala Ile Leu His Thr Pro Gly Cys Val Pro Cys Val Arg Glu Gly
 385 390 395 400

Asn Ala Ser Arg Cys Trp Val Ala Val Thr Pro Thr Val Ala Thr Arg
 405 410 415

Asp Gly Lys Leu Pro Thr Thr Gln Leu Arg Arg His Ile Asp Leu Leu
 420 425 430

Val Gly Ser Ala Thr Leu Cys Ser Ala Leu Tyr Val Gly Asp Leu Cys
 435 440 445

Gly Ser Val Phe Leu Val Gly Gln Leu Phe Thr Phe Ser Pro Arg Arg
 450 455 460

His Trp Thr Thr Gln Asp Cys Asn Cys Ser Ile Tyr Pro Gly His Ile
 465 470 475 480

Thr Gly His Arg Met Ala Trp Asp Met Met Met Asn Trp Ser Pro Thr
 485 490 495

Ala Ala Leu Val Val Ala Gln Leu Leu Arg Ile Pro Gln Ala Ile Met
 500 505 510

Asp Met Ile Ala Gly Ala His Trp Gly Val Leu Ala Gly Ile Ala Tyr
 515 520 525

Phe Ser Met Val Gly Asn Trp Ala Lys Val Leu Val Val Leu Leu Leu
530 535 540

Phe Ala Gly Val Asp Ala Glu Thr His Val Thr Gly Gly Asn Ala Gly
545 550 555 560

Arg Thr Thr Ala Gly Leu Val Gly Leu Leu Thr Pro Gly Ala Lys Gln
565 570 575

Asn Ile Gln Leu Ile Asn Thr Asn Gly Ser Trp His Ile Asn Ser Thr
580 585 590

Ala Leu Asn Cys Asn Glu Ser Leu Asn Thr Gly Trp Leu Ala Gly Leu
595 600 605

Phe Tyr Gln His Lys Phe Asn Ser Ser Gly Cys Pro Glu Arg Leu Ala
610 615 620

Ser Cys Arg Arg Leu Thr Asp Phe Ala Gln Gly Trp Gly Pro Ile Ser
625 630 635 640

Tyr Ala Asn Gly Ser Gly Leu Asp Glu Arg Pro Tyr Cys Trp His Tyr
645 650 655

Pro Pro Arg Pro Cys Gly Ile Val Pro Ala Lys Ser Val Cys Gly Pro
660 665 670

Val Tyr Cys Phe Thr Pro Ser Pro Val Val Val Gly Thr Thr Asp Arg
675 680 685

Ser Gly Ala Pro Thr Tyr Ser Trp Gly Ala Asn Asp Thr Asp Val Phe
690 695 700

Val Leu Asn Asn Thr Arg Pro Pro Leu Gly Asn Trp Phe Gly Cys Thr
705 710 715 720

Trp Met Asn Ser Thr Gly Phe Thr Lys Val Cys Gly Ala Pro Pro Cys
725 730 735

Val Ile Gly Gly Val Gly Asn Asn Thr Leu Leu Cys Pro Thr Asp Cys
740 745 750

Phe Arg Lys His Pro Glu Ala Thr Tyr Ser Arg Cys Gly Ser Gly Pro
755 760 765

Trp Ile Thr Pro Arg Cys Met Val Asp Tyr Pro Tyr Arg Leu Trp His
770 775 780

Tyr	Pro	Cys	Thr	Ile	Asn	Tyr	Thr	Ile	Phe	Lys	Val	Arg	Met	Tyr	Val	785	790	795	800
Gly	Gly	Val	Glu	His	Arg	Leu	Glu	Ala	Ala	Cys	Asn	Trp	Thr	Arg	Gly	805	810	815	
Glu	Arg	Cys	Asp	Leu	Glu	Asp	Arg	Asp	Arg	Ser	Glu	Leu	Ser	Pro	Leu	820	825	830	
Leu	Leu	Ser	Thr	Thr	Gln	Trp	Gln	Val	Leu	Pro	Cys	Ser	Phe	Thr	Thr	835	840	845	
Leu	Pro	Ala	Leu	Ser	Thr	Gly	Leu	Ile	His	Leu	His	Gln	Asn	Ile	Val	850	855	860	
Asp	Val	Gln	Tyr	Leu	Tyr	Gly	Val	Gly	Ser	Ser	Ile	Ala	Ser	Trp	Ala	865	870	875	880
Ile	Lys	Trp	Glu	Tyr	Val	Val	Leu	Leu	Phe	Leu	Leu	Leu	Ala	Asp	Ala	885	890	895	
Arg	Val	Cys	Ser	Cys	Leu	Trp	Met	Met	Leu	Leu	Ile	Ser	Gln	Ala	Glu	900	905	910	
Ala	Ile	Gln	Tyr	Gly	Ser	Gly	Glu	Val	Val	Met	Met	Gly	Asn	Leu	Leu	915	920	925	
Thr	His	Asn	Asn	Ile	Glu	Val	Val	Thr	Tyr	Phe	Leu	Leu	Leu	Tyr	Leu	930	935	940	
Leu	Leu	Arg	Glu	Glu	Ser	Val	Lys	Lys	Trp	Val	Leu	Leu	Leu	Tyr	His	945	950	955	960
Ile	Leu	Val	Val	His	Pro	Ile	Lys	Ser	Val	Ile	Val	Ile	Leu	Leu	Met	965	970	975	
Ile	Gly	Asp	Val	Val	Lys	Ala	Asp	Ser	Gly	Gly	Gln	Glu	Tyr	Leu	Gly	980	985	990	
Lys	Ile	Asp	Leu	Cys	Phe	Thr	Thr	Val	Val	Leu	Ile	Val	Ile	Gly	Leu	995	1000	1005	
Ile	Ile	Ala	Arg	Arg	Asp	Pro	Thr	Ile	Val	Pro	Leu	Val	Thr	Ile	Met	1010	1015	1020	
Ala	Ala	Leu	Arg	Val	Thr	Glu	Leu	Thr	His	Gln	Pro	Gly	Val	Asp	Ile	1025	1030	1035	1040

Ala Val Ala Val Met Thr Ile Thr Leu Leu Met Val Ser Tyr Val Thr	1045	1050	1055
Asp Tyr Phe Arg Tyr Lys Lys Trp Leu Gln Cys Ile Leu Ser Leu Val	1060	1065	1070
Ser Gly Val Phe Leu Ile Arg Ser Leu Ile Tyr Leu Gly Arg Ile Glu	1075	1080	1085
Met Pro Glu Val Thr Ile Pro Asn Trp Arg Pro Leu Thr Leu Ile Leu	1090	1095	1100
Leu Tyr Leu Ile Ser Thr Thr Ile Val Thr Arg Trp Lys Val Asp Val	1105	1110	1115
Ala Gly Leu Leu Leu Gln Cys Val Pro Ile Leu Leu Leu Val Thr Thr	1125	1130	1135
Leu Trp Ala Asp Phe Leu Thr Leu Ile Leu Ile Leu Pro Thr Tyr Glu	1140	1145	1150
Leu Val Lys Leu Tyr Tyr Leu Lys Thr Val Arg Thr Asp Ile Glu Arg	1155	1160	1165
Ser Trp Leu Gly Gly Ile Asp Tyr Thr Arg Val Asp Ser Ile Tyr Asp	1170	1175	1180
Val Asp Glu Ser Gly Glu Gly Val Tyr Leu Phe Pro Ser Arg Gln Lys	1185	1190	1195
Ala Gln Gly Asn Phe Ser Ile Leu Leu Pro Leu Ile Lys Ala Thr Leu	1205	1210	1215
Ile Ser Cys Val Ser Ser Lys Trp Gln Leu Ile Tyr Met Ser Tyr Leu	1220	1225	1230
Thr Leu Asp Phe Met Tyr Tyr Met His Arg Lys Val Ile Glu Glu Ile	1235	1240	1245
Ser Gly Gly Thr Asn Ile Ile Ser Arg Leu Val Ala Ala Leu Ile Glu	1250	1255	1260
Leu Asn Trp Ser Met Glu Glu Glu Glu Ser Lys Gly Leu Lys Lys Phe	1265	1270	1275
Tyr Leu Leu Ser Gly Arg Leu Arg Asn Leu Ile Ile Lys His Lys Val	1285	1290	1295

Arg Asn Glu Thr Val Ala Ser Trp Tyr Gly Glu Glu Glu Val Tyr Gly
 1300 1305 1310

Met Pro Lys Ile Met Thr Ile Ile Lys Ala Ser Thr Leu Ser Lys Ser
 1315 1320 1325

Arg His Cys Ile Ile Cys Thr Val Cys Glu Gly Arg Glu Trp Lys Gly
 1330 1335 1340

Gly Thr Cys Pro Lys Cys Gly Arg His Gly Lys Pro Ile Thr Cys Gly
 1345 1350 1355 1360

Met Ser Leu Ala Asp Phe Glu Glu Arg His Tyr Lys Arg Ile Phe Ile
 1365 1370 1375

Arg Glu Gly Asn Phe Glu Gly Met Cys Ser Arg Cys Gln Gly Lys His
 1380 1385 1390

Arg Arg Phe Glu Met Asp Arg Glu Pro Lys Ser Ala Arg Tyr Cys Ala
 1395 1400 1405

Glu Cys Asn Arg Leu His Pro Ala Glu Glu Gly Asp Phe Trp Ala Glu
 1410 1415 1420

Ser Ser Met Leu Gly Leu Lys Ile Thr Tyr Phe Ala Leu Met Asp Gly
 1425 1430 1435 1440

Lys Val Tyr Asp Ile Thr Glu Trp Ala Gly Cys Gln Arg Val Gly Ile
 1445 1450 1455

Ser Pro Asp Thr His Arg Val Pro Cys His Ile Ser Phe Gly Ser Arg
 1460 1465 1470

Met Pro Phe Arg Gln Glu Tyr Asn Gly Phe Val Gln Tyr Thr Ala Arg
 1475 1480 1485

Gly Gln Leu Phe Leu Arg Asn Leu Pro Val Leu Ala Thr Lys Val Lys
 1490 1495 1500

Met Leu Met Val Gly Asn Leu Gly Glu Glu Ile Gly Asn Leu Glu His
 1505 1510 1515 1520

Leu Gly Trp Ile Leu Arg Gly Pro Ala Val Cys Lys Lys Ile Thr Glu
 1525 1530 1535

His Glu Lys Cys His Ile Asn Ile Leu Asp Lys Leu Thr Ala Phe Phe
 1540 1545 1550

Gly Ile Met Pro Arg Gly Thr Thr Pro Arg Ala Pro Val Arg Phe Pro
 1555 1560 1565

Thr Ser Leu Leu Lys Val Arg Arg Gly Leu Glu Thr Gly Trp Ala Tyr
 1570 1575 1580

Thr His Gln Gly Gly Ile Ser Ser Val Asp His Val Thr Ala Gly Lys
 1585 1590 1595 1600

Asp Leu Leu Val Cys Asp Ser Met Gly Arg Thr Arg Val Val Cys Gln
 1605 1610 1615

Ser Asn Asn Arg Leu Thr Asp Glu Thr Glu Tyr Gly Val Lys Thr Asp
 1620 1625 1630

Ser Gly Cys Pro Asp Gly Ala Arg Cys Tyr Val Leu Asn Pro Glu Ala
 1635 1640 1645

Val Asn Ile Ser Gly Ser Lys Gly Ala Val Val His Leu Gln Lys Thr
 1650 1655 1660

Gly Gly Glu Phe Thr Cys Val Thr Ala Ser Gly Thr Pro Ala Phe Phe
 1665 1670 1675 1680

Asp Leu Lys Asn Leu Lys Gly Trp Ser Gly Leu Pro Ile Phe Glu Ala
 1685 1690 1695

Ser Ser Gly Arg Val Val Gly Arg Val Lys Val Gly Lys Asn Glu Glu
 1700 1705 1710

Ser Lys Pro Thr Lys Ile Met Ser Gly Ile Gln Thr Val Ser Lys Asn
 1715 1720 1725

Thr Ala Asp Leu Thr Glu Met Val Lys Lys Ile Thr Ser Met Asn Arg
 1730 1735 1740

Gly Asp Phe Lys Gln Ile Thr Leu Ala Thr Gly Ala Gly Lys Thr Thr
 1745 1750 1755 1760

Glu Leu Pro Lys Ala Val Ile Glu Glu Ile Gly Arg His Lys Arg Val
 1765 1770 1775

Leu Val Leu Ile Pro Leu Arg Ala Ala Ala Glu Ser Val Tyr Gln Tyr
 1780 1785 1790

Met Arg Leu Lys His Pro Ser Ile Ser Phe Asn Leu Arg Ile Gly Asp
 1795 1800 1805

Met Lys Glu Gly Asp Met Ala Thr Gly Ile Thr Tyr Ala Ser Tyr Gly
 1810 1815 1820

Tyr Phe Cys Gln Met Pro Gln Pro Lys Leu Arg Ala Ala Met Val Glu
 1825 1830 1835 1840

Tyr Ser Tyr Ile Phe Leu Asp Glu Tyr His Cys Ala Thr Pro Glu Gln
 1845 1850 1855

Leu Ala Ile Ile Gly Lys Ile His Arg Phe Ser Glu Ser Ile Arg Val
 1860 1865 1870

Val Ala Met Thr Ala Thr Pro Ala Gly Ser Val Thr Thr Thr Gly Gln
 1875 1880 1885

Lys His Pro Ile Glu Glu Phe Ile Ala Pro Glu Val Met Lys Gly Glu
 1890 1895 1900

Asp Leu Gly Ser Gln Phe Leu Asp Ile Ala Gly Leu Lys Ile Pro Val
 1905 1910 1915 1920

Asp Glu Met Lys Gly Asn Met Leu Val Phe Val Pro Thr Arg Asn Met
 1925 1930 1935

Ala Val Glu Val Ala Lys Lys Leu Lys Ala Lys Gly Tyr Asn Ser Gly
 1940 1945 1950

Tyr Tyr Tyr Ser Gly Glu Asp Pro Ala Asn Leu Arg Val Val Thr Ser
 1955 1960 1965

Gln Ser Pro Tyr Val Ile Val Ala Thr Asn Ala Ile Glu Ser Gly Val
 1970 1975 1980

Thr Leu Pro Asp Leu Asp Thr Val Ile Asp Thr Gly Leu Lys Cys Glu
 1985 1990 1995 2000

Lys Arg Val Arg Val Ser Ser Lys Ile Pro Phe Ile Val Thr Gly Leu
 2005 2010 2015

Lys Arg Met Ala Val Thr Val Gly Glu Gln Ala Gln Arg Arg Gly Arg
 2020 2025 2030

Val Gly Arg Val Lys Pro Gly Arg Tyr Tyr Arg Ser Gln Glu Thr Ala
 2035 2040 2045

Thr Gly Ser Lys Asp Tyr His Tyr Asp Leu Leu Gln Ala Gln Arg Tyr
 2050 2055 2060

Gly Ile Glu Asp Gly Ile Asn Val Thr Lys Ser Phe Arg Glu Met Asn			
2065	2070	2075	2080
Tyr Asp Trp Ser Leu Tyr Glu Glu Asp Ser Leu Leu Ile Thr Gln Leu			
2085	2090	2095	
Glu Ile Leu Asn Asn Leu Leu Ile Ser Glu Asp Leu Pro Ala Ala Val			
2100	2105	2110	
Lys Asn Ile Met Ala Arg Thr Asp His Pro Glu Pro Ile Gln Leu Ala			
2115	2120	2125	
Tyr Asn Ser Tyr Glu Val Gln Val Pro Val Leu Phe Pro Lys Ile Arg			
2130	2135	2140	
Asn Gly Glu Val Thr Asp Thr Tyr Glu Asn Tyr Ser Phe Leu Asn Ala			
2145	2150	2155	2160
Arg Lys Leu Gly Glu Asp Val Pro Val Tyr Ile Tyr Ala Thr Glu Asp			
2165	2170	2175	
Glu Asp Leu Ala Val Asp Leu Leu Gly Leu Asp Trp Pro Asp Pro Gly			
2180	2185	2190	
Asn Gln Gln Val Val Glu Thr Gly Lys Ala Leu Lys Gln Val Thr Gly			
2195	2200	2205	
Leu Ser Ser Ala Glu Asn Ala Leu Leu Val Ala Leu Phe Gly Tyr Val			
2210	2215	2220	
Gly Tyr Gln Ala Leu Ser Lys Arg His Val Pro Met Ile Thr Asp Ile			
2225	2230	2235	2240
Tyr Thr Ile Glu Asp Gln Arg Leu Glu Asp Thr Thr His Leu Gln Tyr			
2245	2250	2255	
Ala Pro Asn Ala Ile Lys Thr Asp Gly Thr Glu Thr Glu Leu Lys Glu			
2260	2265	2270	
Leu Ala Ser Gly Asp Val Glu Lys Ile Met Gly Ala Ile Ser Asp Tyr			
2275	2280	2285	
Ala Ala Gly Gly Leu Glu Phe Val Lys Ser Gln Ala Glu Lys Ile Lys			
2290	2295	2300	
Thr Ala Pro Leu Phe Lys Glu Asn Ala Glu Ala Ala Lys Gly Tyr Val			
2305	2310	2315	2320

Gln Lys Phe Ile Asp Ser Leu Ile Glu Asn Lys Glu Glu Ile Ile Arg
 2325 2330 2335
 Tyr Gly Leu Trp Gly Thr His Thr Ala Leu Tyr Lys Ser Ile Ala Ala
 2340 2345 2350
 Arg Leu Gly His Glu Thr Ala Phe Ala Thr Leu Val Leu Lys Trp Leu
 2355 2360 2365
 Ala Phe Gly Gly Glu Ser Val Ser Asp His Val Lys Gln Ala Ala Val
 2370 2375 2380
 Asp Leu Val Val Tyr Tyr Val Met Asn Lys Pro Ser Phe Pro Gly Asp
 2385 2390 2395 2400
 Ser Glu Thr Gln Gln Glu Gly Arg Arg Phe Val Ala Ser Leu Phe Ile
 2405 2410 2415
 Ser Ala Leu Ala Thr Tyr Thr Tyr Lys Thr Trp Asn Tyr His Asn Leu
 2420 2425 2430
 Ser Lys Val Val Glu Pro Ala Leu Ala Tyr Leu Pro Tyr Ala Thr Ser
 2435 2440 2445
 Ala Leu Lys Met Phe Thr Pro Thr Arg Leu Glu Ser Val Val Ile Leu
 2450 2455 2460
 Ser Thr Thr Ile Tyr Lys Thr Tyr Leu Ser Ile Arg Lys Gly Lys Ser
 2465 2470 2475 2480
 Asp Gly Leu Leu Gly Thr Gly Ile Ser Ala Ala Met Glu Ile Leu Ser
 2485 2490 2495
 Gln Asn Pro Val Ser Val Gly Ile Ser Val Met Leu Gly Val Gly Ala
 2500 2505 2510
 Ile Ala Ala His Asn Ala Ile Glu Ser Ser Glu Gln Lys Arg Thr Leu
 2515 2520 2525
 Leu Met Lys Val Phe Val Lys Asn Phe Leu Asp Gln Ala Ala Thr Asp
 2530 2535 2540
 Glu Leu Val Lys Glu Asn Pro Glu Lys Ile Ile Met Ala Leu Phe Glu
 2545 2550 2555 2560
 Ala Val Gln Thr Ile Gly Asn Pro Leu Arg Leu Ile Tyr His Leu Tyr
 2565 2570 2575

Gly Val Tyr Tyr Lys Gly Trp Glu Ala Lys Glu Leu Ser Glu Arg Thr			
2580	2585	2590	
Ala Gly Arg Asn Leu Phe Thr Leu Ile Met Phe Glu Ala Phe Glu Leu			
2595	2600	2605	
Leu Gly Met Asp Ser Gln Gly Lys Ile Arg Asn Leu Ser Gly Asn Tyr			
2610	2615	2620	
Ile Leu Asp Leu Ile Tyr Gly Leu His Lys Gln Ile Asn Arg Gly Leu			
2625	2630	2635	2640
Lys Lys Met Val Leu Gly Trp Ala Pro Ala Pro Phe Ser Cys Asp Trp			
2645	2650	2655	
Thr Pro Ser Asp Glu Arg Ile Arg Leu Pro Thr Asp Asn Tyr Leu Arg			
2660	2665	2670	
Val Glu Thr Arg Cys Pro Cys Gly Tyr Glu Met Lys Ala Phe Lys Asn			
2675	2680	2685	
Val Gly Gly Lys Leu Thr Lys Val Glu Glu Ser Gly Pro Phe Leu Cys			
2690	2695	2700	
Arg Asn Arg Pro Gly Arg Gly Pro Val Asn Tyr Arg Val Thr Lys Tyr			
2705	2710	2715	2720
Tyr Asp Asp Asn Leu Arg Glu Ile Lys Pro Val Ala Lys Leu Glu Gly			
2725	2730	2735	
Gln Val Glu His Tyr Tyr Lys Gly Val Thr Ala Lys Ile Asp Tyr Ser			
2740	2745	2750	
Lys Gly Lys Met Leu Leu Ala Thr Asp Lys Trp Glu Val Glu His Gly			
2755	2760	2765	
Val Ile Thr Arg Leu Ala Lys Arg Tyr Thr Gly Val Gly Phe Asn Gly			
2770	2775	2780	
Ala Tyr Leu Gly Asp Glu Pro Asn His Arg Ala Leu Val Glu Arg Asp			
2785	2790	2795	2800
Cys Ala Thr Ile Thr Lys Asn Thr Val Gln Phe Leu Lys Met Lys Lys			
2805	2810	2815	
Gly Cys Ala Phe Thr Tyr Asp Leu Thr Ile Ser Asn Leu Thr Arg Leu			
2820	2825	2830	

Ile Glu Leu Val His Arg Asn Asn Leu Glu Glu Lys Glu Ile Pro Thr	2835	2840	2845
Ala Thr Val Thr Thr Trp Leu Ala Tyr Thr Phe Val Asn Glu Asp Val	2850	2855	2860
Gly Thr Ile Lys Pro Val Leu Gly Glu Arg Val Ile Pro Asp Pro Val	2865	2870	2875 2880
Val Asp Ile Asn Leu Gln Pro Glu Val Gln Val Asp Thr Ser Glu Val	2885	2890	2895
Gly Ile Thr Ile Ile Gly Arg Glu Thr Leu Met Thr Thr Gly Val Thr	2900	2905	2910
Pro Val Leu Glu Lys Val Glu Pro Asp Ala Ser Asp Asn Gln Asn Ser	2915	2920	2925
Val Lys Ile Gly Leu Asp Glu Gly Asn Tyr Pro Gly Pro Gly Ile Gln	2930	2935	2940
Thr His Thr Leu Thr Glu Glu Ile His Asn Arg Asp Ala Arg Pro Phe	2945	2950	2955 2960
Ile Met Ile Leu Gly Ser Arg Asn Ser Ile Ser Asn Arg Ala Lys Thr	2965	2970	2975
Ala Arg Asn Ile Asn Leu Tyr Thr Gly Asn Asp Pro Arg Glu Ile Arg	2980	2985	2990
Asp Leu Met Ala Ala Gly Arg Met Leu Val Val Ala Leu Arg Asp Val	2995	3000	3005
Asp Pro Glu Leu Ser Glu Met Val Asp Phe Lys Gly Thr Phe Leu Asp	3010	3015	3020
Arg Glu Ala Leu Glu Ala Leu Ser Leu Gly Gln Pro Lys Pro Lys Gln	3025	3030	3035 3040
Val Thr Lys Glu Ala Val Arg Asn Leu Ile Glu Gln Lys Lys Asp Val	3045	3050	3055
Glu Ile Pro Asn Trp Phe Ala Ser Asp Asp Pro Val Phe Leu Glu Val	3060	3065	3070
Ala Leu Lys Asn Asp Lys Tyr Tyr Leu Val Gly Asp Val Gly Glu Val	3075	3080	3085

Lys Asp Gln Ala Lys Ala Leu Gly Ala Thr Asp Gln Thr Arg Ile Ile
 3090 3095 3100

Lys Glu Val Gly Ser Arg Thr Tyr Ala Met Lys Leu Ser Ser Trp Phe
 3105 3110 3115 3120

Leu Gln Ala Ser Asn Lys Gln Met Ser Leu Thr Pro Leu Phe Glu Glu
 3125 3130 3135

Leu Leu Leu Arg Cys Pro Pro Ala Thr Lys Ser Asn Lys Gly His Met
 3140 3145 3150

Ala Ser Ala Tyr Gln Leu Ala Gln Gly Asn Trp Glu Pro Leu Gly Cys
 3155 3160 3165

Gly Val His Leu Gly Thr Ile Pro Ala Arg Arg Val Lys Ile His Pro
 3170 3175 3180

Tyr Glu Ala Tyr Leu Lys Leu Lys Asp Phe Ile Glu Glu Glu Glu Lys
 3185 3190 3195 3200

Lys Pro Arg Val Lys Asp Thr Val Ile Arg Glu His Asn Lys Trp Ile
 3205 3210 3215

Leu Lys Lys Ile Arg Phe Gln Gly Asn Leu Asn Thr Lys Lys Met Leu
 3220 3225 3230

Asn Pro Gly Lys Leu Ser Glu Gln Leu Asp Arg Glu Gly Arg Lys Arg
 3235 3240 3245

Asn Ile Tyr Asn His Gln Ile Gly Thr Ile Met Ser Ser Ala Gly Ile
 3250 3255 3260

Arg Leu Glu Lys Leu Pro Ile Val Arg Ala Gln Thr Asp Thr Lys Thr
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Phe His Glu Ala Ile Arg Asp Lys Ile Asp Lys Ser Glu Asn Arg Gln
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Asn Pro Glu Leu His Asn Lys Leu Leu Glu Ile Phe His Thr Ile Ala
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Gln Pro Thr Leu Lys His Thr Tyr Gly Glu Val Thr Trp Glu Gln Leu
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Glu Ala Gly Ile Asn Arg Lys Gly Ala Ala Gly Phe Leu Glu Lys Lys
 3330 3335 3340

Asn Ile Gly Glu Val Leu Asp Ser Glu Lys His Leu Val Glu Gln Leu			
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Val Arg Asp Leu Lys Ala Gly Arg Lys Ile Lys Tyr Tyr Glu Thr Ala			
3365	3370	3375	
Ile Pro Lys Asn Glu Lys Arg Asp Val Ser Asp Asp Trp Gln Ala Gly			
3380	3385	3390	
Asp Leu Val Val Glu Lys Arg Pro Arg Val Ile Gln Tyr Pro Glu Ala			
3395	3400	3405	
Lys Thr Arg Leu Ala Ile Thr Lys Val Met Tyr Asn Trp Val Lys Gln			
3410	3415	3420	
Gln Pro Val Val Ile Pro Gly Tyr Glu Gly Lys Thr Pro Leu Phe Asn			
3425	3430	3435	3440
Ile Phe Asp Lys Val Arg Lys Glu Trp Asp Ser Phe Asn Glu Pro Val			
3445	3450	3455	
Ala Val Ser Phe Asp Thr Lys Ala Trp Asp Thr Gln Val Thr Ser Lys			
3460	3465	3470	
Asp Leu Gln Leu Ile Gly Glu Ile Gln Lys Tyr Tyr Tyr Lys Lys Glu			
3475	3480	3485	
Trp His Lys Phe Ile Asp Thr Ile Thr Asp His Met Thr Glu Val Pro			
3490	3495	3500	
Val Ile Thr Ala Asp Gly Glu Val Tyr Ile Arg Asn Gly Gln Arg Gly			
3505	3510	3515	3520
Ser Gly Gln Pro Asp Thr Ser Ala Gly Asn Ser Met Leu Asn Val Leu			
3525	3530	3535	
Thr Met Met Tyr Ala Phe Cys Glu Ser Thr Gly Val Pro Tyr Lys Ser			
3540	3545	3550	
Phe Asn Arg Val Ala Arg Ile His Val Cys Gly Asp Asp Gly Phe Leu			
3555	3560	3565	
Ile Thr Glu Lys Gly Leu Gly Leu Lys Phe Ala Asn Lys Gly Met Gln			
3570	3575	3580	
Ile Leu His Glu Ala Gly Lys Pro Gln Lys Ile Thr Glu Gly Glu Lys			
3585	3590	3595	3600

Met Lys Val Ala Tyr Arg Phe Glu Asp Ile Glu Phe Cys Ser His Thr
3605 3610 3615

Pro Val Pro Val Arg Trp Ser Asp Asn Thr Ser Ser His Met Ala Gly
3620 3625 3630

Arg Asp Thr Ala Val Ile Leu Ser Lys Met Ala Thr Arg Leu Asp Ser
3635 3640 3645

Ser Gly Glu Arg Gly Thr Thr Ala Tyr Glu Lys Ala Val Ala Phe Ser
3650 3655 3660

Phe Leu Leu Met Tyr Ser Trp Asn Pro Leu Val Arg Arg Ile Cys Leu
3665 3670 3675 3680

Leu Val Leu Ser Gln Gln Pro Glu Thr Asp Pro Ser Lys His Ala Thr
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Tyr Tyr Tyr Lys Gly Asp Pro Ile Gly Ala Tyr Lys Asp Val Ile Gly
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Arg Asn Leu Ser Glu Leu Lys Arg Thr Gly Phe Glu Lys Leu Ala Asn
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Leu Asn Leu Ser Leu Ser Thr Leu Gly Ile Trp Thr Lys His Thr Ser
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Lys Arg Ile Ile Gln Asp Cys Val Ala Ile Gly Lys Glu Glu Gly Asn
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Trp Leu Val Asn Ala Asp Arg Leu Ile Ser Ser Lys Thr Gly His Leu
3765 3770 3775

Tyr Ile Pro Asp Lys Gly Phe Thr Leu Gln Gly Lys His Tyr Glu Gln
3780 3785 3790

Leu Gln Leu Arg Thr Glu Thr Asn Pro Val Met Gly Val Gly Thr Glu
3795 3800 3805

Arg Tyr Lys Leu Gly Pro Ile Val Asn Leu Leu Leu Arg Arg Leu Lys
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<211> 9711

<212> DNA

<213> Hepatitis C virus

<400> 3

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caagactgct agccgagtag cgttgggttg cgaaaggcct tgtggtactg cctgataggg 300
tgcttgcgag tgccccggga ggtctcgtag accgtgcacc atgagcacia atcctaaacc 360
tcaaagaaaa accaaaagaa acaccaaccg tcgcccacaa gacgtttaagt ttccgggcg 420
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cccgggtctc gctgccgaag tgaagaacat cagtaccggc tacatgggtga ctaacgactg 960
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<212> PRT

<213> Hepatitis C virus

<400> 4

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          20                      25                      30

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Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala
          35                      40                      45

```

```

Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
          50                      55                      60

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```

Ile Pro Lys Asp Arg Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro Gly
          65                      70                      75                      80

```

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Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Leu Gly Trp Ala Gly Trp
          85                      90                      95

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Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Asn Asp Pro
 100 105 110

Arg His Arg Ser Arg Asn Val Gly Lys Val Ile Asp Thr Leu Thr Cys
 115 120 125

Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Val Val Gly Ala Pro Leu
 130 135 140

Gly Gly Val Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp
 145 150 155 160

Gly Val Asn Phe Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
 165 170 175

Phe Leu Leu Ala Leu Leu Ser Cys Ile Thr Thr Pro Val Ser Ala Ala
 180 185 190

Glu Val Lys Asn Ile Ser Thr Gly Tyr Met Val Thr Asn Asp Cys Thr
 195 200 205

Asn Asp Ser Ile Thr Trp Gln Leu Gln Ala Ala Val Leu His Val Pro
 210 215 220

Gly Cys Val Pro Cys Glu Lys Val Gly Asn Ala Ser Gln Cys Trp Ile
 225 230 235 240

Pro Val Ser Pro Asn Val Ala Val Gln Arg Pro Gly Ala Leu Thr Gln
 245 250 255

Gly Leu Arg Thr His Ile Asp Met Val Val Met Ser Ala Thr Leu Cys
 260 265 270

Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Gly Val Met Leu Ala Ala
 275 280 285

Gln Met Phe Ile Val Ser Pro Gln His His Trp Phe Val Gln Asp Cys
 290 295 300

Asn Cys Ser Ile Tyr Pro Gly Thr Ile Thr Gly His Arg Met Ala Trp
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Asp Met Met Met Asn Trp Ser Pro Thr Ala Thr Met Ile Leu Ala Tyr
 325 330 335

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Leu His Thr Gly Phe Ile Ala Ser Leu Phe Tyr Thr His Ser Phe Asn
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Glu Lys Leu Val Ile Leu His Ala Ala Ser Ala Ala Ser Cys Asn Gly
 755 760 765

Phe Leu Tyr Phe Val Ile Phe Phe Val Ala Ala Trp Tyr Ile Lys Gly
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Arg Val Val Pro Leu Ala Thr Tyr Ser Leu Thr Gly Leu Trp Ser Phe
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His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Val Ala Tyr	1235	1240	1245
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Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ala Val Asp Ser Thr	1315	1320	1325
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Val Arg Leu Thr Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr	1345	1350	1355
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Val Val Ala Pro Asp Lys Glu Val Leu Tyr Glu Ala Phe Asp Glu Met			
1700	1705	1710	
Glu Glu Cys Ala Ser Arg Ala Ala Leu Ile Glu Glu Gly Gln Arg Ile			
1715	1720	1725	
Ala Glu Met Leu Lys Ser Lys Ile Gln Gly Leu Leu Gln Gln Ala Ser			
1730	1735	1740	
Lys Gln Ala Gln Asp Ile Gln Pro Thr Val Gln Ala Ser Trp Pro Lys			
1745	1750	1755	1760
Val Glu Gln Phe Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile			
1765	1770	1775	
Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Val Ala			
1780	1785	1790	
Ser Met Met Ala Phe Ser Ala Ala Leu Thr Ser Pro Leu Ser Thr Ser			
1795	1800	1805	
Thr Thr Ile Leu Leu Asn Ile Leu Gly Gly Trp Leu Ala Ser Gln Ile			
1810	1815	1820	
Ala Pro Pro Ala Gly Ala Thr Gly Phe Val Val Ser Gly Leu Val Gly			
1825	1830	1835	1840
Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val Asp Ile Leu			
1845	1850	1855	
Ala Gly Tyr Gly Ala Gly Ile Ser Gly Ala Leu Val Ala Phe Lys Ile			
1860	1865	1870	
Met Ser Gly Glu Lys Pro Ser Met Glu Asp Val Val Asn Leu Leu Pro			
1875	1880	1885	

Gly Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Ile Cys Ala Ala
 1890 1895 1900

Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met
 1905 1910 1915 1920

Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val Ala Pro Thr
 1925 1930 1935

His Tyr Val Thr Glu Ser Asp Ala Ser Gln Arg Val Thr Gln Leu Leu
 1940 1945 1950

Gly Ser Leu Thr Ile Thr Ser Leu Leu Arg Arg Leu His Asn Trp Ile
 1955 1960 1965

Thr Glu Asp Cys Pro Ile Pro Cys Gly Gly Ser Trp Leu Arg Asp Val
 1970 1975 1980

Trp Asp Trp Val Cys Thr Ile Leu Thr Asp Phe Lys Asn Trp Leu Thr
 1985 1990 1995 2000

Ser Lys Leu Phe Pro Lys Met Pro Gly Leu Pro Phe Val Ser Cys Gln
 2005 2010 2015

Lys Gly Tyr Lys Gly Val Trp Ala Gly Thr Gly Ile Met Thr Thr Arg
 2020 2025 2030

Cys Pro Cys Gly Ala Asn Ile Ser Gly Asn Val Arg Leu Gly Ser Met
 2035 2040 2045

Arg Ile Thr Gly Pro Lys Thr Cys Met Asn Ile Trp Gln Gly Thr Phe
 2050 2055 2060

Pro Ile Asn Cys Tyr Thr Glu Gly Gln Cys Val Pro Lys Pro Ala Pro
 2065 2070 2075 2080

Asn Phe Lys Val Ala Ile Trp Arg Val Ala Ala Ser Glu Tyr Ala Glu
 2085 2090 2095

Val Thr Gln His Gly Ser Tyr His Tyr Ile Thr Gly Leu Thr Thr Asp
 2100 2105 2110

Asn Leu Lys Val Pro Cys Gln Leu Pro Ser Pro Glu Phe Phe Ser Trp
 2115 2120 2125

Val Asp Gly Val Gln Ile His Arg Phe Ala Pro Thr Pro Lys Pro Phe
 2130 2135 2140

Phe Arg Asp Glu Val Ser Phe Cys Val Gly Leu Asn Ser Phe Val Val
2145 2150 2155 2160

Gly Ser Gln Leu Pro Cys Asp Pro Glu Pro Asp Thr Asp Val Leu Met
 2165 2170 2175

Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr Ala Ala Arg
 2180 2185 2190

Arg Leu Ala Arg Gly Ser Pro Pro Ser Glu Ala Ser Ser Ser Ala Ser
 2195 2200 2205

Gln Leu Ser Ala Pro Ser Leu Arg Ala Thr Cys Thr Thr His Gly Lys
 2210 2215 2220

Ala Tyr Asp Val Asp Met Val Asp Ala Asn Leu Phe Met Gly Gly Asp
2225 2230 2235 2240

Val Thr Arg Ile Glu Ser Gly Ser Lys Val Val Val Leu Asp Ser Leu
 2245 2250 2255

Asp Pro Met Val Glu Glu Arg Ser Asp Leu Glu Pro Ser Ile Pro Ser
 2260 2265 2270

Glu Tyr Met Leu Pro Lys Lys Arg Phe Pro Pro Ala Leu Pro Ala Trp
 2275 2280 2285

Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Ser Trp Lys Arg Pro
 2290 2295 2300

Asp Tyr Gln Pro Ala Thr Val Ala Gly Cys Ala Leu Pro Pro Pro Arg
2305 2310 2315 2320

Lys Thr Pro Thr Pro Pro Pro Arg Arg Arg Arg Thr Val Gly Leu Ser
 2325 2330 2335

Glu Asp Ser Ile Gly Asp Ala Leu Gln Gln Leu Ala Ile Lys Ser Phe
 2340 2345 2350

Gly Gln Pro Pro Pro Ser Gly Asp Ser Gly Leu Ser Thr Gly Ala Gly
 2355 2360 2365

Ala Ala Asp Ser Gly Ser Gln Thr Pro Pro Asp Glu Leu Ala Leu Ser
 2370 2375 2380

Glu Thr Gly Ser Ile Ser Ser Met Pro Pro Leu Glu Gly Glu Leu Gly
2385 2390 2395 2400

Asp Pro Asp Leu Glu Pro Glu Gln Val Glu Pro Gln Pro Pro Pro Gln
2405 2410 2415

Gly Gly Val Ala Ala Pro Gly Ser Asp Ser Gly Ser Trp Ser Thr Cys
2420 2425 2430

Ser Glu Glu Asp Asp Ser Val Val Cys Cys Ser Met Ser Tyr Ser Trp
2435 2440 2445

Thr Gly Ala Leu Ile Thr Pro Cys Ser Pro Glu Glu Glu Lys Leu Pro
2450 2455 2460

Ile Asn Pro Leu Ser Asn Ser Leu Leu Arg Tyr His Asn Lys Val Tyr
2465 2470 2475 2480

Cys Thr Thr Thr Lys Ser Ala Ser Leu Arg Ala Lys Lys Val Thr Phe
2485 2490 2495

Asp Arg Met Gln Val Leu Asp Ser Tyr Tyr Asp Ser Val Leu Lys Asp
2500 2505 2510

Ile Lys Leu Ala Ala Ser Lys Val Thr Ala Arg Leu Leu Thr Met Glu
2515 2520 2525

Glu Ala Cys Gln Leu Thr Pro Pro His Ser Ala Arg Ser Lys Tyr Gly
2530 2535 2540

Phe Gly Ala Lys Glu Val Arg Ser Leu Ser Gly Arg Ala Val Asn His
2545 2550 2555 2560

Ile Lys Ser Val Trp Lys Asp Leu Leu Glu Asp Ser Glu Thr Pro Ile
2565 2570 2575

Pro Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Asp Pro Thr
2580 2585 2590

Lys Gly Gly Lys Lys Ala Ala Arg Leu Ile Val Tyr Pro Asp Leu Gly
2595 2600 2605

Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Ile Thr Gln Lys Leu
2610 2615 2620

Pro Gln Ala Val Met Gly Ala Ser Tyr Gly Phe Gln Tyr Ser Pro Ala
2625 2630 2635 2640

Gln Arg Val Glu Phe Leu Leu Lys Ala Trp Ala Glu Lys Lys Asp Pro
2645 2650 2655

Met Gly Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu
 2660 2665 2670

Arg Asp Ile Arg Thr Glu Glu Ser Ile Tyr Arg Ala Cys Ser Leu Pro
 2675 2680 2685

Glu Glu Ala His Thr Ala Ile His Ser Leu Thr Glu Arg Leu Tyr Val
 2690 2695 2700

Gly Gly Pro Met Phe Asn Ser Lys Gly Gln Thr Cys Gly Tyr Arg Arg
 2705 2710 2715 2720

Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Met Gly Asn Thr Ile Thr
 2725 2730 2735

Cys Tyr Val Lys Ala Leu Ala Ala Cys Lys Ala Ala Gly Ile Ile Ala
 2740 2745 2750

Pro Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Ser Glu Ser
 2755 2760 2765

Gln Gly Thr Glu Glu Asp Glu Arg Asn Leu Arg Ala Phe Thr Glu Ala
 2770 2775 2780

Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Arg Pro Glu Tyr
 2785 2790 2795 2800

Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala Leu
 2805 2810 2815

Gly Pro Gln Gly Arg Arg Arg Tyr Tyr Leu Thr Arg Asp Pro Thr Thr
 2820 2825 2830

Pro Ile Ala Arg Ala Ala Trp Glu Thr Val Arg His Ser Pro Val Asn
 2835 2840 2845

Ser Trp Leu Gly Asn Ile Ile Gln Tyr Ala Pro Thr Ile Trp Ala Arg
 2850 2855 2860

Met Val Leu Met Thr His Phe Phe Ser Ile Leu Met Ala Gln Asp Thr
 2865 2870 2875 2880

Leu Asp Gln Asn Leu Asn Phe Glu Met Tyr Gly Ala Val Tyr Ser Val
 2885 2890 2895

Ser Pro Leu Asp Leu Pro Ala Ile Ile Glu Arg Leu His Gly Leu Asp
 2900 2905 2910

Ala Phe Ser Leu His Thr Tyr Thr Pro His Glu Leu Thr Arg Val Ala
2915 2920 2925

Ser Ala Leu Arg Lys Leu Gly Ala Pro Pro Leu Arg Ala Trp Lys Ser
2930 2935 2940

Arg Ala Arg Ala Val Arg Ala Ser Leu Ile Ser Arg Gly Gly Arg Ala
2945 2950 2955 2960

Ala Val Cys Gly Arg Tyr Leu Phe Asn Trp Ala Val Lys Thr Lys Leu
2965 2970 2975

Lys Leu Thr Pro Leu Pro Glu Ala Arg Leu Leu Asp Leu Ser Ser Trp
2980 2985 2990

Phe Thr Val Gly Ala Gly Gly Gly Asp Ile Tyr His Ser Val Ser Arg
2995 3000 3005

Ala Arg Pro Arg Leu Leu Leu Phe Gly Leu Leu Leu Leu Phe Val Gly
3010 3015 3020

Val Gly Leu Phe Leu Leu Pro Ala Arg
3025 3030